AVEVA™ E3D Design

Seamless, collaborative design—anytime, anywhere

AVEVA E3D Design is an advanced, powerful 3D engineering design solution designed for the process plant, marine and power industries. By enabling clash-free, multi-discipline collaboration in the cloud, AVEVA E3D Design gives teams the tools they need to maximize engineering and design efficiency while minimizing rework. Teams can rapidly generate accurate drawings and reports to reduce costs, timescales and commercial risks associated with greenfield and brownfield capital projects.

AVEVA E3D Design is compatible with other AVEVA engineering and design solutions and can simply and securely be deployed in the cloud or a hybrid environment.

AV=VA

Rapid business benefits enable bottom-line results

Intuitive interface streamlines adoption

- Minimal staff training requirements enable rapid ramp-up to full productivity

- Fast deployment through globally available AVEVA designers and system administrators

- Quick, easy connection of individual remote workers and globally dispersed teams to project data

Start projects fast

- Set up new projects in hours, not days, with minimal system administration

Realize new design efficiencies

- Maximize design productivity with a seamless, intuitive interface

- Accurately and automatically generate on-demand drawings and reports directly from the 3D model, saving time and effort in the design office, eliminating sources of error and ensuring that fabrication and construction use validated, up-to-date information

- Make informed decisions and bolster project management using accurate and comprehensive change and status reporting

- Integrate AVEVA E3D Design with engineering tools so users can create 3D designs from P&ID schematics, and efficiently import and route electrical cables into 3D models

- Use integrated photorealistic laser scan data in the design environment to rapidly, intuitively and accurately plan modification design and construction status verification against the design intent as construction progresses

Minimize rework, maximize efficiency

- Efficiently and comprehensively detect clashes to eliminate costly on-site rework in the design stage

- Use laser scans of as-fabricated and as-built construction to update your design model and enable rapid and effective correction or accommodation of any non-compliant construction

- Produce accurate drawings, reports, and bills of materials (BoMs) directly from your 3D project model

- Automatically produce rule-based drawings to ensure fabrication and construction drawings meet project standards and are based on the most up-to-date design data

Stay compliant every step of the way

- Consistently enable high-quality design using rule-based automation and configurable consistency checking, significantly reducing person-hours

- Streamline collaboration and ensure compliance with design rules, best practices and contractual requirements with change highlighting, tracking and status management

Seamlessly execute projects from concept to handoff

- Share configurations, templates, catalogs, design data, rules and customizations between projects

- Build libraries of design assemblies or commonly used modules for reuse on new projects

- Use with AVEVA™ Global to rapidly and flexibly configure and reconfigure multi-location projects

- Advanced work packaging (AWP) capabilities support construction planning and path of construction activities

Scale up and out to meet future needs

- AVEVA E3D Design is a scalable solution with no limit on project size or complexity

- Self-integrate AVEVA design, engineering and information management products and solutions into the initial AVEVA E3D Design deployment to expand project scope and benefits

Take a simple, integrated approach to design

Easy configuration

AVEVA E3D Design can be quickly configured to suit specific company or project requirements, including:

- Data structures
- Access rights
- Design status controls
- Consistency-checking rules
- Report and drawing formats

AVEVA E3D Design can be used for multi-discipline design on a wide variety of complex projects across a number of industries

> Get current information about
> **AVEVA E3D Design releases.**

AVEVA E3D Design makes it simple to manage multiple concurrent projects. Users can apply configurations at a project level and customize company- or project-specific procedures and workflows, enabling compliance with client requirements on individual concurrent projects. From there, teams can use built-in macro language and PML together with a .NET API to create custom, flexible functionalities to build valuable proprietary expertise.
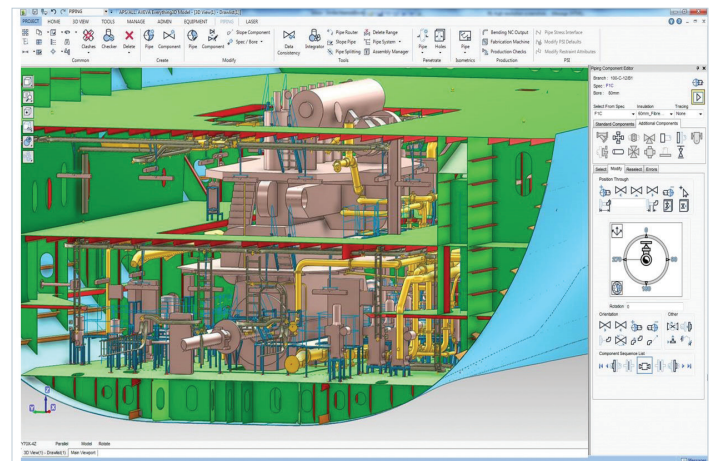
Marine capabilities

AVEVA E3D Design can work alongside AVEVA marine products on projects, making a fully clashable and drawable hull model available to AVEVA E3D Design users. Users can also create hull symbolic views inside AVEVA E3D Design's DRAW module, making AVEVA E3D Design an ideal partner for any marine project.

Hull data in the 3D view

Easily integrate laser scan data into the design environment

With AVEVA E3D Design, companies can realize new value and efficiencies on both greenfield and brownfield projects. When designing modifications to existing assets, users can accurately align new design tie-in points while eliminating clashes between the new and existing construction. By rapidly importing laser scans of individual fabrications, modules, or the current status of the as-built site, users can easily verify imported information against the design model.

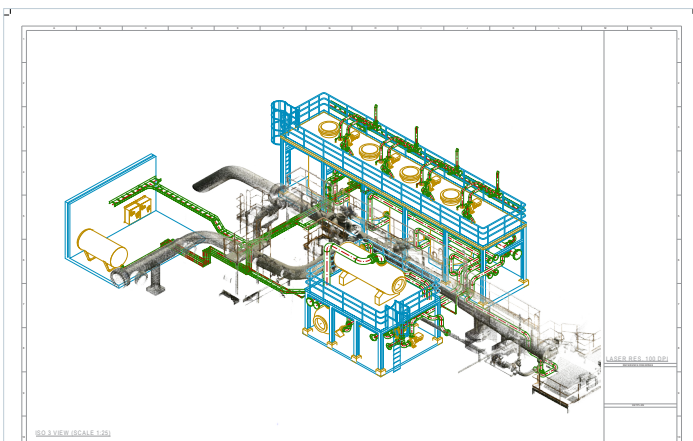

Laser scan data integrated into the 3D view

Since users can continually update the design model to accurately reflect new designs along with true, as-built construction, they can ensure everyone has access to one centralized, reliable design model for the entire asset life cycle. With access to one single source of truth, they can quickly resolve any non-compliance issues and ensure the project continues to run on schedule.

AVEVA E3D Design users can both import and interact with data from any laser scanner, including traditional static scanners and mobile, airborne, and and-held devices from a wide choice of manufacturers such as FARO, Leica, Geosystems HDS, Riegl, Trimble Dimensions, and Z+F. AVEVA E3D Design's laser capabilities are based on point cloud technology and work with AVEVA™ Point Cloud Manager data sets.

Incorporating new and unique HyperBubble™ technology allows the user to work in a fully immersed as-built environment. AVEVA E3D Design allows users to demolish parts of the point cloud data and, when used alongside AVEVA Point Cloud Manager with supporting work processes, they can demolish and add updated scans, delivering a "trusted living point cloud." Users can treat this as their 3D world for modeling, safe in the knowledge that they have the most up-to-date information possible.

Machine learning module

Easily import trained machine learning (ML) models directly from the user interface using PML to give users access to ML-enabled technology.

Intuitive user interface

By incorporating the latest Microsoft® Fluent™ interface technology, gesture interaction and configurable context menus, AVEVA E3D Design streamlines the process of design, making it easier, more enjoyable, and more productive. Gain rapid access to frequently used functions using AVEVA PowerWheel command accelerator, saving time and maximizing efficiency.

Integration with AVEVA engineering tools

AVEVA E3D Design enables users to import data from engineering and schematic applications, such as AVEVA™ Engineering and AVEVA P&ID applications, and automatically create the corresponding 3D objects that are ready for positioning in the model.

Using a three-way association between schematic, engineering and 3D data, it's easy for users to ensure any changes or inconsistencies are reflected in all until accepted or corrected.

Similarly, AVEVA E3D Design integrates with AVEVA™ Electrical and AVEVA™ Instrumentation, allowing cable data sharing with AVEVA E3D Design, facilitating accurate routing of cables according to configurable design rules and returning accurate cable lengths.

Laser data in DRAW avoids the need to remodel existing constructions
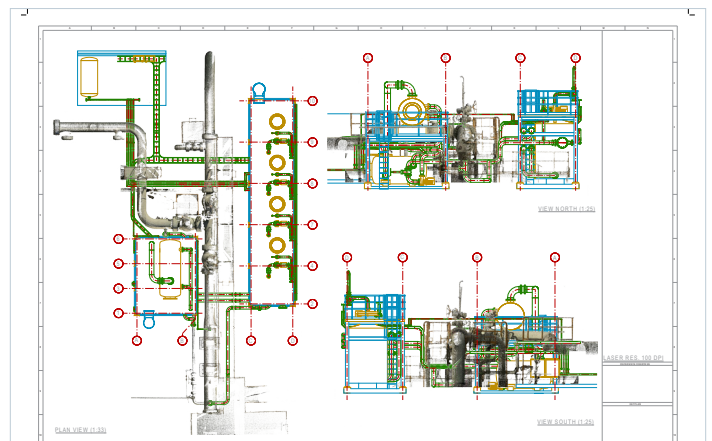
Layout and arrangement drawings can include laser data

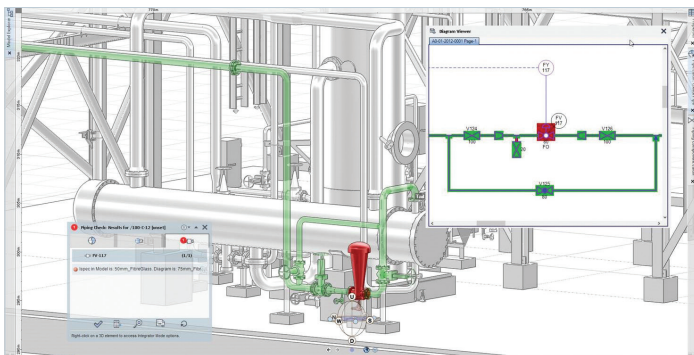## AVEVA™ Model Simplification and AVEVA™ Native Model Simplification

These modules are available at no cost for all AVEVA E3D Design users and enable them to reduce file sizes by orders of magnitude. These modules import simplified versions of complex 3D CAD models of equipment items that have been created in external Mechanical CAD (MCAD) systems.

Laser data in drawings

The ability to demolish laser data and keep the point cloud up to date is critical, but AVEVA 3D Design goes one step further by allowing users to add the point cloud to drawings, as with any other model element. Now, rather than modeling old plans using incomplete or unclear information, users can represent up-to-date laser data in drawings with a simple, cost-effective laser scan–reducing person-hours and saving significant project costs.

In-context access to the full digital asset

Design in Context™ enhances the design process by serving up relevant content from the digital asset to design teams, all within AVEVA E3D Design, improving the speed and reliability of their design decisions. The Design in Context capability creates a direct connection to the centralized digital asset repository (if available). When an object is selected in AVEVA E3D Design, the context panel dynamically updates a list of available content relevant to the selection, such as datasheets, vendor documentation, purchase orders, planning charts and calculation sheets. This content can then be opened in context with the selected object via a new embedded universal viewer, ensuring users can make decisions using all available information.

Optimal use of design automation and rules

AVEVA E3D Design features extensive design automation capabilities through rule configurations that respect engineering boundaries and access rights. These capabilities offer the productivity advantages of rule-based design automation while ensuring that design authority for changes remains with the relevant responsible disciplines.

If a non-compliant design feature is created, the system highlights and explains the non-compliance until it is corrected. By permitting a designer to create a provisional, non-compliant feature as an interim step in the process of refining a compliant overall design, less experienced designers can rapidly increase their skills by learning while doing.

Many 3D design solutions offer automatic pipe and cable tray routing of pipes using preconfigured rules, but this alone rarely creates an optimal design. AVEVA E3D Design enables a designer to switch between automatic routing and intuitive manual adjustment tools to save time on simple or repetitive work and refine the routes for a high-quality overall design.

Similarly, users can configure rules for stairs, ladders, and handrails that follow project standards and designers can quickly and easily incorporate these standards-compliant structures into the overall design.

Automatic cable routing

As a standard feature, AVEVA E3D Design enables users to set preconfigured rules, defining parameters such as tray fill levels, route selection, and signal/power cable separation to automatically route instrumentation and/or electrical cables into cable trays.

Integrated engineering – compare and update between P&ID and 3D model


Automatic change highlighting

Users can obtain cable definitions from AVEVA Electrical and AVEVA Instrumentation, or import this information from third-party systems via Microsoft Excel. Accurate cable lengths, including any excess allowances, can be returned in the same ways for the creation of BoMs and drumming.

Maximize data and designs

AVEVA E3D Design enables companies to share and reuse data, engineering standards, catalogs, and reference designs between projects. This not only saves the cost and time associated with unnecessary duplication, it also eliminates many opportunities for error, maximizes the value of proprietary design expertise and enables more efficient repeat projects.

Efficient management of subcontract work packages

Subcontracting work is common practice, and all companies must manage the interface with the subcontractor and validate their work before accepting it. AVEVA E3D Design provides unique extract functionality that enables a subcontractor to work independently and develop a design package without impacting the master project model. Upon approval, users can automatically incorporate that work into the project model.
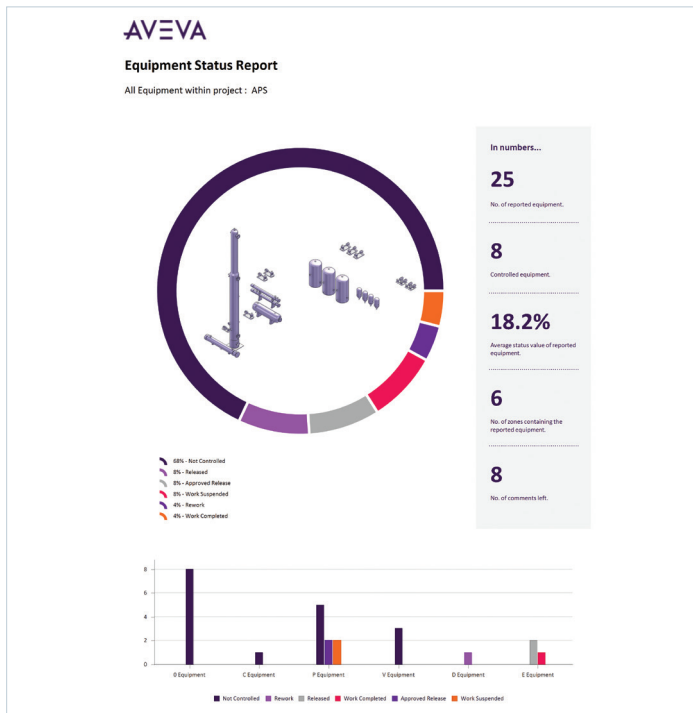
Effective change management

Design is an iterative process, involving many continual changes as it progresses from the initial concept to its final, fully detailed state.

AVEVA E3D Design provides robust change management functions that enable designers to make and accommodate changes in a controlled manner, see what has changed, and automatically create an audit trail of changes as they work.

For example, AVEVA's unique compare-and-update function enables AVEVA E3D Design piping designers to compare the definition of the line they are working on against the line list and P&ID data.

When designers identify differences, they can choose when to implement which changes, prioritize and plan an efficient workload and ensure data consistency before producing deliverables. They can highlight changes in the 3D model and in 2D drawings to communicate and ensure the visibility of changes until they are corrected.

Above and above, right: Examples of reports showing the design status of equipment in a project

Design quality assurance

Intelligent clash detection and highlighting, both between individual design objects and between design objects and laser scans of an as-built structure, helps designers avoid clashes as they work. Users can classify clashes for reporting and management purposes as "hard," where objects physically occupy overlapping space, or "soft," where objects' exclusion volumes for accessibility overlap, or as intermediate conditions. All clashes are reported for project management purposes until eliminated.

- Inbuilt status control enables designers to clearly specify the status of their work and to easily understand the maturity of data from other disciplines that they work with

- Consistency checking between the 3D model and the P&ID highlights inconsistencies in the data and enables selective electronic updating

- Sophisticated data management and access controls ensure that each designer has the correct level of access to relevant project information

- Configurable design rule-checking enables users to extend or modify the default rules provided in the standard AVEVA E3D Design deployment, ensuring projects are meeting company or client-specific standards

Configurable deliverable automation

Many drafting tasks are repetitive. Configurable automation tools enable users to automatically generate annotated and dimensioned drawings, which can typically save thousands of person-hours on a project.

Since all deliverables–drawings, piping isometrics, BoMs, or reports–are generated directly from the definitive 3D design model, users can ensure a drawing's accuracy, completeness and compliance with project standards.

AVEVA E3D Design's DRAW module also includes advanced 2D drafting tools that interact with the design model, enabling customers to quickly and easily add notes, annotations, sketches and dimensions without the need for a separate 2D drafting system.

Object-centric data management

Unlike file-based design systems, AVEVA designs are database-driven. As designers work, they are creating an object-centric description of the entire project. Each object, such as a valve, pump, or pipe, can be viewed with an extensive quantity of attribute and association data.

The project database represents a digital asset, which not only supports the access rights, change control, status management, and workflows required for efficient project execution, but can also be shared with AVEVA™ Enterprise Resource Management, ERP, and MIS systems for efficient business management. Companies can use this information to populate a client's information management system for asset life cycle management.

Project and discipline management tools

Designers, departmental managers and discipline managers can use configurable status reporting in their day-to-day work to monitor progress, forecast workloads, and enforce adherence to workflows and change control.
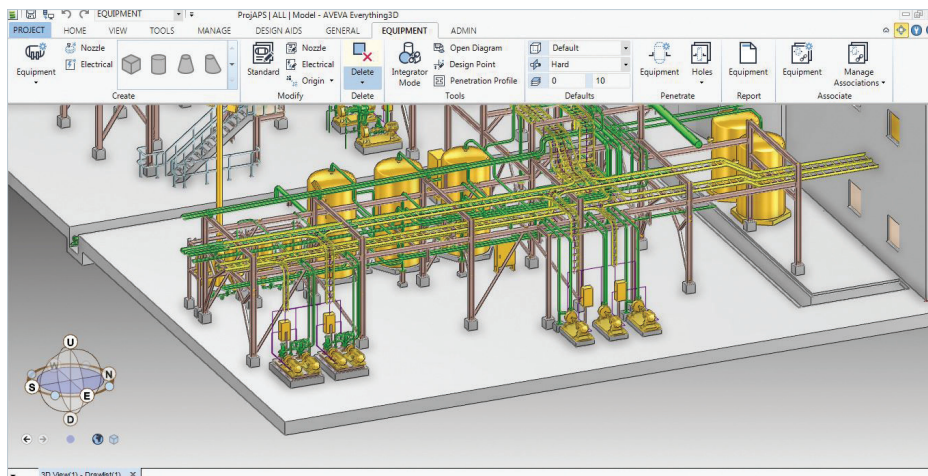
User-adjustable edge definition, shadows, transparency and highlights make it easier to understand complex 3D models

Additional products

AVEVA E3D Design may be deployed as part of AVEVA™ Unified Engineering, AVEVA's real-time, integrated engineering environment.

To maximize and streamline new deployments of AVEVA E3D Design, users with no existing AVEVA infrastructure can leverage:

- AVEVA™ Administration for system administration and configuration
- AVEVA™ Catalog to define engineering specifications and component catalogs

Users can extend capabilities and efficiency with:

- AVEVA Global to manage distributed, multi-location working
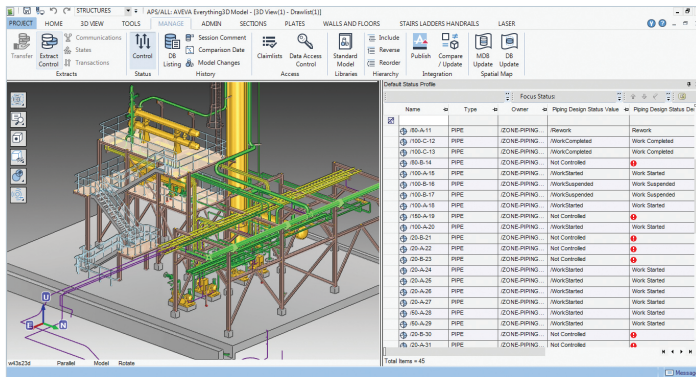
Status information is managed in the 3D model and can be queried and included in reports

AVEVA E3D Design add-ons

AVEVA™ E3D Whitespace Optimizer

AVEVA E3D Whitespace Optimizer frees technical staff from the time-consuming, repetitive, detail-focused burden of checking and editing automatically produced drawings. Backed by a powerful AI-enabled engine via AVEVA Connect, our common industrial cloud platform, users can easily and efficiently use drawing whitespace to autonomously clean up annotations on drawing deliverables.

3DFindlt

3DFindlt is a free add-on that gives users access to Cadena's vast library of vendor-supplied, mechanical equipment models and data, which can be effortlessly integrated into 3D plant and ship models.

Training

AVEVA offers classroom and online self-training in our secure cloud environment for our customers, giving them flexible options to deepen their knowledge with our team of experts.

To find out more or register your interest, please visit the AVEVA training page.

aveva.com